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A DANGEROUS NEIGHBOR

FOR WHEAT, OATS, BARLEY, AND RYE

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tment of Agriculture

The rust-spreading barberry

UNITED STATES
DEPARTMENT OF AGRICULTURE
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE

. . and the States of Colorado, Illinois, Indiana, Iowa, ichigan, Missouri, Minnesota, Montana, Nebraska, North akota, Ohio, Pennsylvania, South Dakota, Virginia, West irginia, Wisconsin, and Wyoming cooperating.

Miscellaneous Publication No. 131

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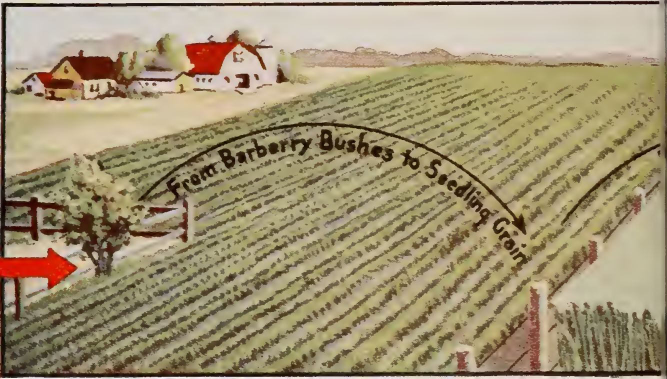
How Black Stem Rus


From Barberry Bushes to Seedling Grain

EARLY SPRING

Black stem rust is one of the most destructive diseases that attack wheat, oats, barley, and rye. The fungus that causes this disease not only steals all of its food from other plants but ruptures the stems of the growing grains, allowing much of the moisture to evaporate. Badly rusted fields yield light-weight and poor-quality grain.

Early in the spring the black rust spores that have lived through the winter on straw and stubble germinate and cause rust on the leaves of nearby common barberry bushes. The orange-colored spots that appear on the barberry leaves are small cuplike growths containing thousands of tiny rust spores, each of which can cause rust on growing grain. An average-sized barberry bush can produce more than 64,000,000,000 spores at one time. The wind carries them to wild grasses and growing grains, where they cause the red or summer stage of the rust.

Common Salt Applied at the Roots of a Barberry Bush Kills It Quickly

COMMON BARBERRY

Growth—Tall, erect shrub, with many canes; any height up to 10 feet.

Leaves—Green or purple, with saw-toothed edges.

Bark—Outer bark gray, inner bark and root bright yellow.

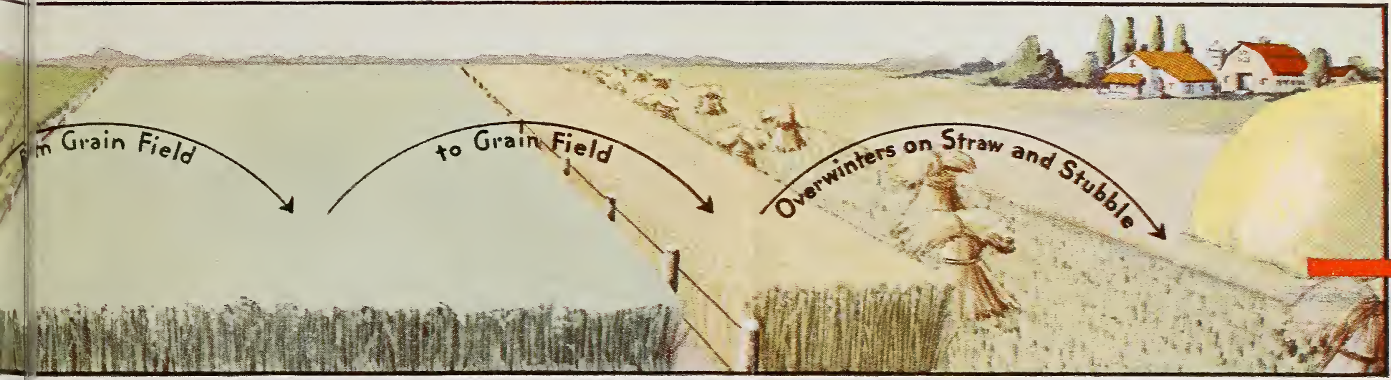
Spines—Usually three to five in a group.

Berries—Bright red, oval berries are in bunches like currants.

Reduce Black Stem Rust

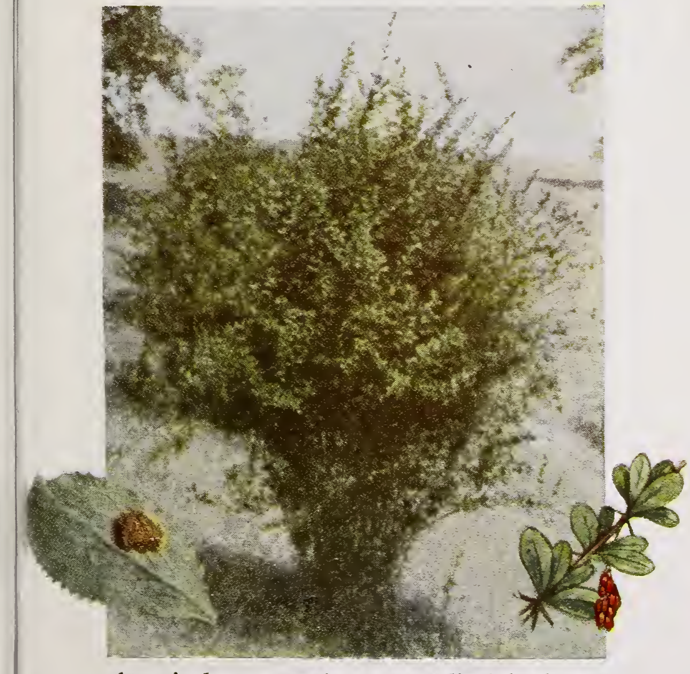
Report the location of all common Barberry Bushes

Spreads from Common Barberry to Grain


Grain Field
to Grain Field
Overwinters on Straw and Stubble

ALL SUMMER

The rapidity with which the rust spreads from one grain ield to another depends upon the weather. If the weather s hot and muggy, new crops of red spores are produced on he grain plants about every week or 10 days. These spores an spread from one grain field to another throughout the growing season. Live rust spores from barberry have been ound 7,500 feet in the air, indicating that barberry bushes growing in one county may be the cause of rust in another ounty many miles away.



A typical common (rust-spreading) barberry

FALL AND WINTER

As the grain ripens, black spores are produced on the grains and grasses. These black spores, which give the disease its name, remain alive throughout the winter. In the spring they germinate and cause rust on susceptible species of barberry. If no barberry bushes are near, the spring spores die. Thus local spreads of stem rust may be prevented by eliminating barberry bushes, for the red or summer stage of the disease that spreads from grainfield to grainfield during the growing season will not survive the winter in the northern States.

Furthermore, there are many varieties or strains of the stem-rust fungus, any two of which may hybridize on a barberry leaf, producing one or more entirely new strains of the disease. These new strains of the fungus may attack varieties of grain that heretofore have proved resistant to stem rust. Thus barberry eradication serves a double purpose.

Japanese Barberry Is Harmless
Do Not Destroy It

JAPANESE BARBERRY

Growth—Low and spreading, seldom more than 4½ to 5 feet high.

Leaves—Small, green or purple, smooth edges.

Bark—Outer bark reddish-brown, inner bark and roots bright yellow.

Spines—Usually single.

Berries—Bright red, oval, borne singly or in pairs.

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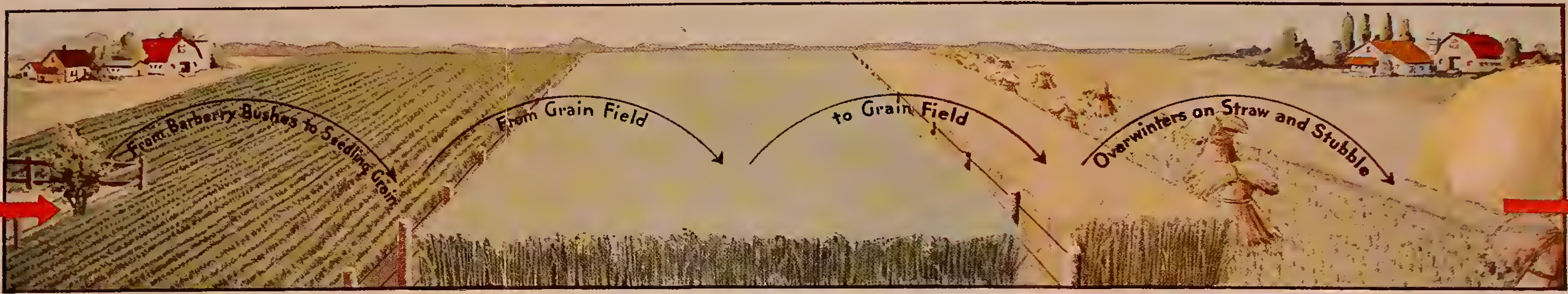
How Black Stem Rust Spreads from Common Barberry to Grain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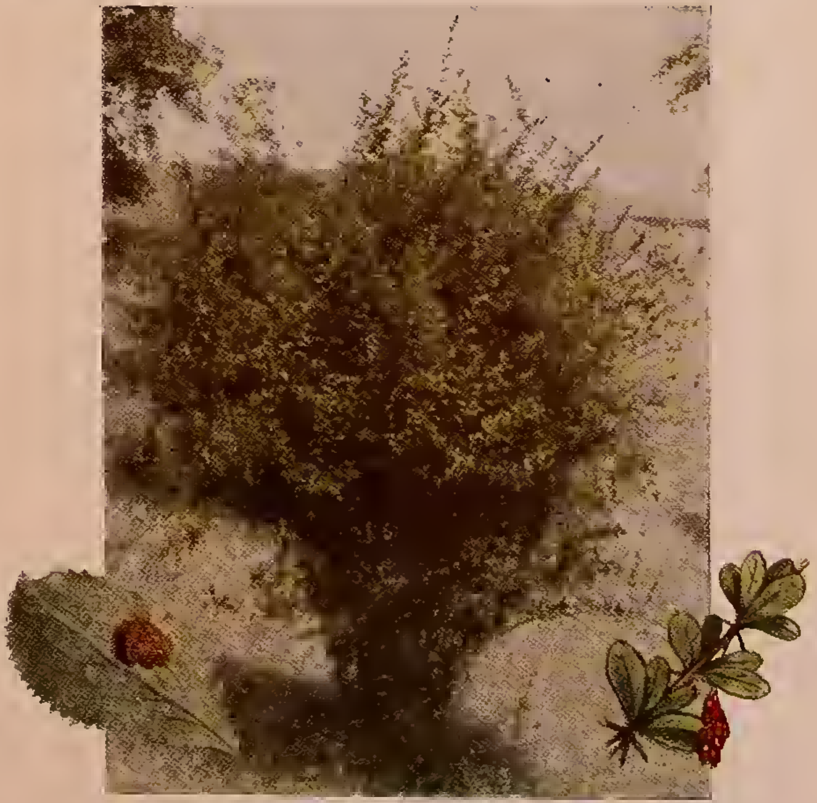

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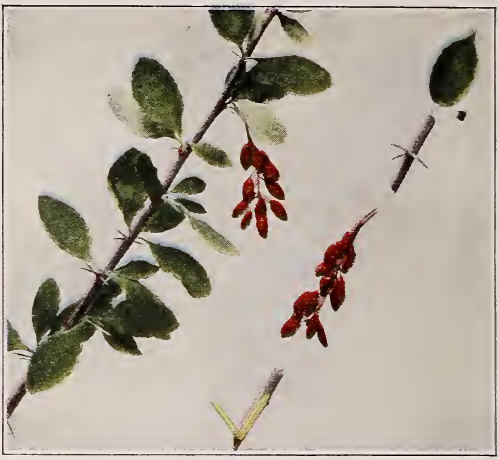

Learn to Know the Rust-Spreading Barberry

The eradication of barberry bushes is not a new and untried method of reducing losses caused by stem rust. As early as 1660 France passed laws prohibiting the growing of barberry bushes near grain fields. For years Denmark, the Netherlands, Germany, Norway, England, and France have recognized the value of barberry eradication as a rust-control measure.

Some of America's earliest settlers brought barberry bushes with them, and seed produced on the few that were planted was widely scattered by birds. About 1700, farmers began to complain that their grains were blasted when grown near barberries, and in 1726 Connecticut enacted the first legislation in the United States requiring the eradication of these bushes. Not until 1918, however, was an organized eradication movement begun. By this time barberry bushes were prevalent throughout the important grain-growing States, and the damage caused by stem rust amounted to millions of dollars each year. Since 1918, more than 250 million rust-spreading barberry bushes have been destroyed in the 17 States that are cooperating with the U. S. Department of Agriculture in the stem-rust control work.

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Wheat Stems Showing Injury From Stem Rust

Stem rust usually causes the greatest damage when growing conditions otherwise favor good crops. Once the disease appears in a field of grain, the rapidity with whic it spreads depends upon moisture, temperature, and stag of maturity of the crop.

The rust fungus multiplies by means of spores tha germinate and grow much like the seeds of ordinary cro plants. If rust appears early in the season, and frequen rains or heavy dews follow, it is almost certain that extensive damage will occur, as several generations of spore may develop before the grain matures. Badly rusted field of grain often yield less than half a normal crop, and th harvested grain has little value either for feed or millin purposes.

Losses from stem rust in the northern part of the Unite States can be reduced by (1) eradicating all rust-susceptibl species of barberry, (2) growing the rust resistant varieti of grain best adapted to local conditions, and (3) plantin spring grains early on well-prepared soil.

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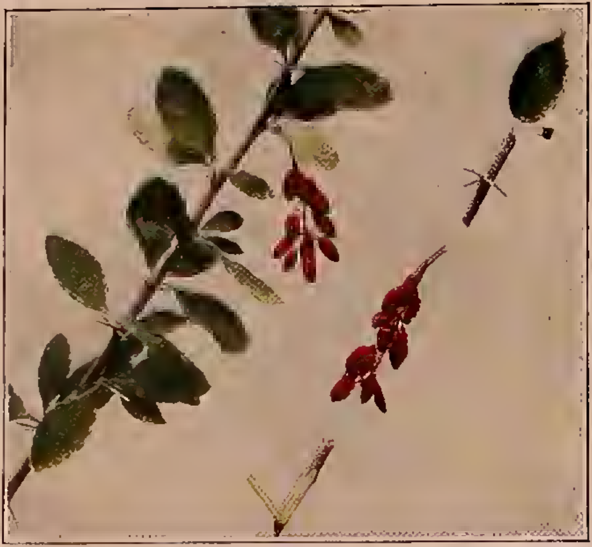

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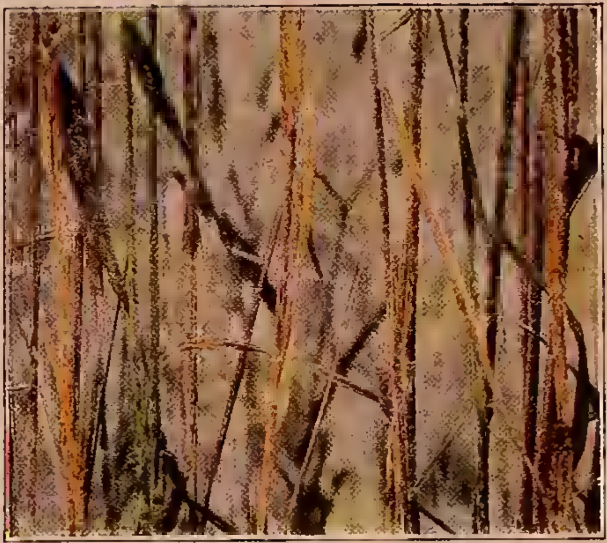

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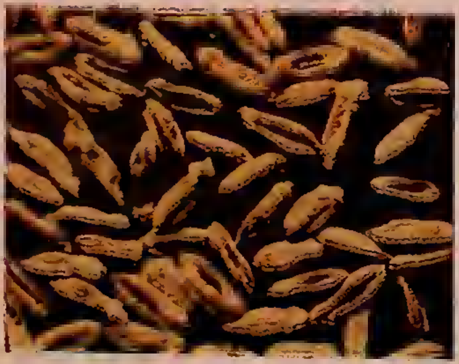

WHEAT FROM A
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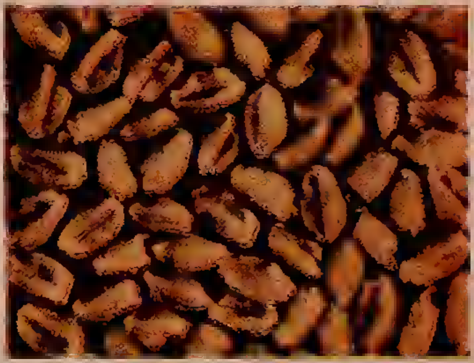

LOSSES FROM STEM RUST DECREASE AS PROGRESS IS MADE IN BARBERRY ERADICATIO